

At different times Antarctica has formed part of several earlier super-continents, the latest of which, Gondwana, is now widely dispersed to form the present southern continents plus India. Antarctica provides crucial evidence linking all of these, including Australia.

Find out about Antarctica's rich Devonian fish faunas from Southern Victoria Land and their world-wide links; the Permo-Triassic amphibian and mammal-like reptile faunas with strong links to South Africa; the spectacular discovery of Jurassic dinosaur skeletons, recovered from high in the Trans-Antarctic mountains along the Beardmore Glacier; the discovery of fossil bird and mammal remains (including early marsupials) on Seymour Island, off the Antarctic Peninsula – and the fascinating stories behind these and many more.

Some of the descriptions are unavoidably a bit technical but don't be put off. The text is clearly written and is backed by a nine page scientific glossary. It is illustrated by a wealth of beautiful photographs, supplemented by artists' recon-

structions, as well as stunning images of Antarctic landscapes.

In 1970–71 I had the good fortune to be invited to join a two-month-long New Zealand university expedition to Antarctica to search for Devonian fish fossils. It was an unforgettable experience and some of the finest specimens I discovered are featured in *Frozen in Time*.

I have always hoped that someone would write and illustrate the story of past life in Antarctica to let others share its fascinating history. Now Jeffrey Stilwell and John Long have done just that for the first time and we are in their debt.

I strongly recommend *Frozen in Time* and, if you can't buy it yourself, I suggest that you recommend it to your local public library or school library so everyone can enjoy it and share in the thrill of discovery on a frozen continent.

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Life in a gall: The biology and ecology of insects that live in plant galls

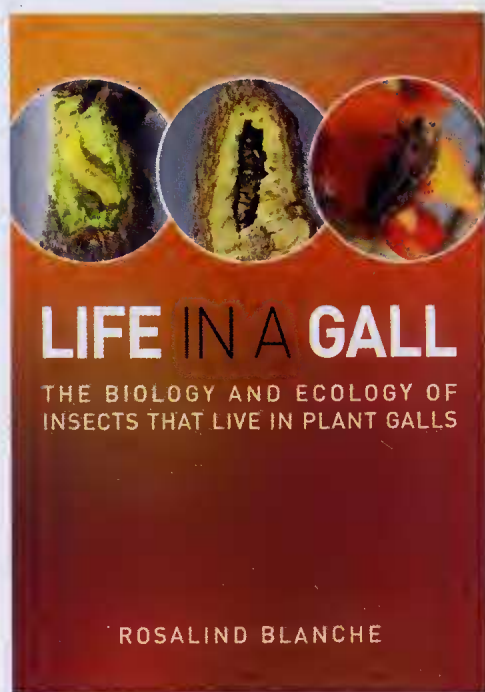
by Rosalind Blanche

Publisher: CSIRO Publishing, Collingwood, Victoria, 2012. 80 pages, paperback, colour illustrations. ISBN 9780643106437. RRP \$29.95.

The intricate relationships between insects and plants take many forms, from simple external herbivory to the subtle and highly specific associations that can result in insects living within plants as highly co-evolved foliage-miners or, as here, gall-formers. These varied taxa induce the plants to produce highly characteristic excrescences (galls) that serve as a domicile for the insect, leaving it unexposed to the outer world. Galls have for long intrigued biologists. The extensive arrays of cynipoid wasps forming galls on oak trees in the northern hemisphere, together with their numerous and equally specific associates (so that each gall can become the hub of a community of the primary gall-forming species, its parasitoids and inquilines)

were studied, for example, by Alfred Kinsey long before his noteworthy studies of human sexuality.

Galls are very special structures, as Rosalind Blanche demonstrates in this excellent short introduction, and are induced by many kinds of insect as well as other animals and fungi. This book is both highly readable and scientifically informative, with its appeal enhanced by the numerous excellent colour photographs (many of them contributed by recognised experts in the insect groups depicted) and clear diagrams that adorn each page. It brings together information on many of Australia's highly characteristic and endemic endophytic insects in a context that emphasises their intriguing ecology



and peculiarities, and their values to humanity. Written for the non-specialist, the seven (un-numbered) chapters flow logically in linking central themes.

In her introduction, Dr Blanche emphasises the great variety of galls, and that each may be highly characteristic, with its form and host plant often diagnostic for the causative agent. Illustrations show several representatives, including the *Uromycladium* fungus gall on *Acacia*, which can be subsequently invaded by many kinds of insect, some of them specific to this habitat; some photographs depict galls opened to reveal their inhabitants. This chapter is wide-ranging and informative, but here (and later in the book) the cautionary comments on what we do *not* know pose many intriguing questions for investigation. The second chapter is a broad introduction to the variety of gall-inducing insects, emphasising the paucity of knowledge of many groups that include some notable Australian radiations of spe-

cies. I found this account in places a little too abbreviated—comment on Hymenoptera, for example, does not mention many of the taxa that are used as examples later in the book—but the synopsis does generally set the scene well for the next two chapters on gall insect biology ('Remarkable adaptations', 'Enemies of gall-forming insects'). The intricacies of the various relationships are well considered, and it was a pleasure to see photographs of my favourite wasp parasitoid of gall-formers—the spectacular 'dart-tailed wasp' (*Cameronella*) that attacks *Apiomorpha* coccoids. The full array of such associates remains to be documented for almost all Australian gall communities.

The penultimate two chapters move to the impacts and values of gall-insects to people, as pests (such as the citrus gall wasp, *Bruchophagus fellis*) and biological control agents (such as the *Trichilogaster* wasps used to control pestiferous Australian acacias in South Africa). Other values include pollination, with the unique mutualisms of figs and fig wasps (Agaonidae) described clearly.

A final chapter, obligatory reading for field naturalists, shows how people can contribute meaningfully to enlarging knowledge of gall insects, through studying and rearing them. An innovative school project is described, as an example of community contribution, and the possibilities for parallels are endless.

The book concludes with a short pertinent 'further reading' list, a glossary and an index.

Dr Blanche has achieved a great deal in this short book; she writes enthusiastically and conveys complex information very clearly. It is also very well produced. I have no hesitation in recommending the book as a significant summary and introduction to the variety of gall insects in Australia, and of wide interest to naturalists of many persuasions.

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